SYMONS'S
MONTHLY
METEOROLOGICAL MAGAZINE.

CCCCXV.] AUGUST, 1900. [PRICE FOURPENCE, or 5s. per ann. post free.

JULY, 1900.

THE past month has yielded so many exceptional phenomena that a dozen numbers of this Magazine would be requisite to deal with it fully, but we cannot let it pass without some special reference to its great heat, its thunder and hail storms of exceptional severity, and the cloud-burst on Rombald's Moor, similar in character to those on the Cheviots and at Angerton, described in *British Rainfall*, 1893 and 1898 respectively.

It is difficult to realize from description the havoc wrought, and the photographs received from Mr. Wilson give a clearer idea of it than many pages of letterpress would do. Some of these we hope to reproduce in *British Rainfall*, 1900, when we shall have all available records of the great rainfall.

THE CLOUD-BURST ON ROMBALD'S MOOR.

To the Editor of the Meteorological Magazine.

SIR,—On Thursday afternoon, July 12th, a terrific thunderstorm raged over a part of the West Riding of Yorkshire, beginning in the west about noon, and extending or propagating itself gradually eastwards. The direction of motion of the thunder clouds was from S. to N., although, as is usual in such cases, the surface winds were very variable under the storm area, and in the district to the eastward the sky was very clear and blue, and a strong easterly wind blew in towards the storm-centre. The cloud summits, as I saw them from Bradford at 0.30 p.m., covering the western sky were exceptionally massive and grand. As far as I am able to ascertain, the most intense part of the storm occurred between 2 and 3 p.m., over the part of Rombald's Moor situated between Bingley and Ilkley, along a band running nearly S. and N.

I regret that I was at Bradford all day, and did not return to Ilkley until 8.15 p.m. I had considerable difficulty in walking the half-mile from the station to my house in Eaton Road, as the roads were like mountain torrents (even at that hour, 5 hours after the

storm was at its height), and strewn with sand and stones 8 to 18 in. deep all over, brought down from the moor and the higher parts of the village. The rain had continued from about 2 p.m. to 8 p.m., but after 3.30 it was only moderately heavy. During the first hour the fall was *most exceptional* and very disastrous in its effects. My wife measured the contents of gauge at 6 p.m., and found it contained 3·93 in., and from 6 to 8 p.m. a further ·33 in. fell, giving a total of 4·26 in. On enquiry, I find that Mr. Worfolk, Brook Street, about half-mile E.N.E. of Eaton Road, registered 4·01 in.; and Mr. Robinson, gardener at Cherry Bank, a house situated 300 ft. higher up the hillside towards the moor, and say ¼-mile S. of Eaton Road, registered 5·40 in. ! He tells me that his gauge is unfortunately somewhat shaded, and he thinks six inches would more nearly represent the correct amount. On the moor above, I believe there was much more; in fact, what is popularly called a "cloud-burst," judging from the enormous volume of water which came down the Parish Gill Beck. The first road-bridge met with on its course, at a distance of only one mile from the summit ridge of the moor, was destroyed, and many hundreds of tons of stones and rocks, the largest measuring 4 ft. × 3 ft. × 3 ft., and many 3 ft. × 3 ft. × 2 ft. and smaller, were scattered over the roads and across the land bordering the stream. The total drainage area of the beck above the bridge is very small, and includes only about ¾ sq. mile. A gamekeeper who lives on the moor, not far away and rather higher up, says the clouds seemed to touch the ground, and the water poured down the land in all directions. Further below, on the course of the same stream, bridges, walls, roads and adjoining gardens were swept away; and in Heber's Gill, the next beck further west, nearly every bridge has been destroyed and immense damage done. In the village of Ilkley itself, one man lost his life by the collapsing of the building in which he was working before he was able to escape, and several others had narrow escapes from drowning. I enclose a cutting from the *Ilkley Gazette*, which gives some idea of the devastation in Ilkley. The description is not at all overdrawn; in fact, it is inadequate, and to realize the magnitude of the destruction, it is necessary to see it oneself. The roads and streets are torn up to an extraordinary extent, and many are impassable to vehicles. I have taken some photographs illustrating the damage. I also enclose cuttings from the *Bradford Observer*, which give an account of the destruction in Sunnydale and at Morton, on the Bingley side of the moor. At Sunnydale Reservoir 4·12 in. of rain was recorded. It must be remembered, however, that the drainage area of the Sunnydale stream is considerable, and many times greater than that of any of the four Ilkley becks. In connection with this, the rainfall registered at Gilstead (4·50 in.), about two miles to the S.E. of Morton, is interesting; and it is quite possible that in the upper part of Sunnydale the rainfall was as violent, or more so, than it was just over the watershed on the Wharfedale side. At Esholt, 2½ miles

N.E. of Shipley, 2·15 in. fell; while near Bradford the records were: Heaton, 3·30 in.; Manningham, 3·11 in.; The Exchange, 1·66 in.—at the latter station ·86 in. fell between 3.10 p.m. and 3.30 p.m.

It may be interesting to add, that the maximum temperature registered in Stevenson screen was 77°·1 on the day of the storm, and 84°·2 the previous day. This latter is exceptional for Ilkley, and the highest I have yet registered here.—I am, yours truly,

ALBERT WILSON.

4, Eaton Road, Ilkley, July 14th, 1900.

NOTES EXTRACTED FROM THE PRESS.

The greatest destruction was wrought along the line of the principal streams having their source on Ilkley Moor, viz., Heber's Gill, Parish Gill, Mill Gill and Backstone Beck. On the latter the bridge near Wharfedale School was carried away, trees were torn up and walls demolished. The water coming down Mill Gill converted Brook Street into a torrent, and a number of out-buildings behind the Wharfedale Hotel were carried away. In some houses at the bottom of Church Street the water was from 5 ft. to 6 ft. deep. The most damage was done by the rush of water down Parish Gill; where the stream crosses Westwood Drive a hole was washed out nine or ten yards across. At Chapel Lane the force of the water caused a wall and shed to collapse at a coachbuilder's yard, and undermined the foundations of the main workshop, which also collapsed about 4 p.m., killing one of the inmates, and so great was the wreck that it was nearly 6 o'clock before the body could be recovered. In the adjoining houses in Chapel Lane the flood was 6 ft. deep, and much property was carried away. In Back Middleton Road nearly the whole of the back wall of a house was carried away, and a portion of that of the adjoining house. On Heber's Gill the substantial stone bridge at the bottom was destroyed, as were some of the lighter structures above. Prior to the storm, the Wharfe was so low that the immense volume of water failed to overflow its banks, though it caused a rise of 6 ft. or 7 ft. The Surveyor to the Ilkley District Council estimates that £11,000 will be required to repair the damage to the public roads, &c.

On the Morton Beck the first serious damage was at Upper Mill, where the flood carried away the roadway and the causeway, and surrounded four cottages, sweeping out furniture before anything could be done to save it. The end house pointing to the head of the stream had some of its walls swept down. At Botany Mill the water made a breach in the part of the premises which is carried over the beck, demolished and carried away the settling tanks and a small dam at the Paper Mill. At Messrs. Wright's Mill the reservoir embankment was wrecked, the supports of that part of the building which spanned the stream were washed away, and one corner of the machine room was carried away. The Dimples Dam

had two big breaches made in it. Four footbridges were washed away, and the Midland Railway was damaged and for a time in danger.

TEMPERATURE.

The following table of Maximum temperatures in July, 1900, taken from various sources, will show that the extreme readings were limited to the southern part of England, for at Oxford the highest is 90° and at Loughborough 89°.

Maximum Temperatures, July 10th to 27th, 1900.

Date.	Tenterden.	Dungeness.	Brixton.	Greenwich.	Kensington, Edith Road.	Camden Square, (Glaisher Stand).	Camden Square, (Stevenson Screen).	Oxford.	Ross.	Castle Ashby.	Yarmouth.	Loughborough.	Liverpool.	Spurn Head.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°
10	81·0	67	83	82·7	83·8	85·2	85·9	82	83·8	...	66	82	77	72
11	82·0	75	86	84·7	85·7	87·2	86·8	84	87·6	...	67	87	80	70
12	...	70	80	76·9	80·7	80·4	79·2	82	...	...	68	85	65	65
13	81·0	68	83	83·6	82·4	85·2	84·1	79	...	...	70	80	71	71
14	...	67	75	75·9	74·9	77·3	76·2	72	...	...	72	73	67	74
15	81·0	72	80	84·1	81·2	83·9	83·3	78	...	...	68	79	74	67
16	91·0	82	92	94·0	92·4	95·2	93·4	78	78·2	...	71	80	73	69
17	...	75	83	82·9	84·2	85·6	84·2	79	80·6	82	71	79	69	71
18	81·0	75	85	85·3	86·1	87·2	87·0	83	84·6	87	72	84	75	69
19	87·0	76	92	91·7	92·1	93·4	93·2	90	88·2	92	70	89	74	74
20	88·5	72	91	90·2	90·9	92·9	90·9	83	82·2	89	70	81	80	68
21	...	71	78	78·1	77·0	80·2	78·3	75	...	77	75	76	74	74
22	81·0	70	80	80·9	80·3	82·3	80·7	77	...	78	71	76	67	71
23	80·0	74	82	82·9	84·2	86·3	86·1	83	83·6	86	71	80	72	75
24	84·5	76	87	88·2	87·8	90·1	88·2	85	86·1	92	82	86	74	84
25	88·5	77	91	93·0	91·4	94·0	92·9	89	86·9	79	78	86	69	78
26	81·5	77	80	80·7	80·2	83·2	81·5	79	79·6	...	71	75	66	72
27	...	70	80	76·5	78·5	80·4	78·3	80	80·1	...	67	80	71	67
Highest ...	91·8	82	92	94·0	92·4	95·2	93·4	90	88·2	92	82	89	80	84
90 or above	1	0	4	4	4	5	4	1	0	2	0	0	0	0
80 or above	13	1	16	14	15	17	14	10	10	...	1	12	2	1

The variation of the temperature in different parts of London is not so great as has occurred in other periods of heat :—

	Brixton. Stevenson Screen.		Greenwich. Glaisher Stand.		Kensington. Stevenson Screen.		Camden Square. Glaisher Stand.		Camden Square. Stevenson Screen.
	°		°		°		°		°
16th.....	92·0	...	94·0	...	92·4	...	95·2	...	93·4
19th.....	92·0	...	91·7	...	92·1	...	93·4	...	93·2
20th.....	91·0	...	90·2	...	90·9	...	92·9	...	90·9
25th.....	91·0	...	93·0	...	91·4	...	94·0	...	92·9

while on July 15th, 1881, Greenwich recorded 97°·1, Brixton 95°·0 and Camden Square 94°·6; and in August, 1893, the maxima were—Greenwich 95°·1, Camden Square 93°·6, Brixton 93°·0 and Kensington 91°·8.

During the hot period the minima were remarkably high, frequently exceeding 60° over a large part of England. In the South the 23rd had the highest minimum, but at Yarmouth and Spurn Head it occurred two days later, while at Liverpool it was earlier.

Minimum Temperatures, July 16th to 28th, 1900.

Date.	Dungeness.	Brixton.	Greenwich.	Camden Square. (Glaisher Screen.)	Camden Square. (Stevenson Screen.)	Oxford.	Ross.	Castle Ashby.	Yarmouth.	Loughborough.	Liverpool.	Spurn Head.
July	°	°	°	°	°	°	°	°	°	°	°	°
16	61	60	58·3	59·7	60·6	54	...	...	61	57	61	57
17	64	60	62·0	60·2	60·9	52	...	54	60	53	57	59
18	58	58	56·4	57·2	59·7	54	...	53	55	49	55	58
19	55	55	52·6	56·1	58·6	53	...	54	62	52	58	58
20	64	64	62·1	63·2	64·1	62	...	60	62	63	64	58
21	62	61	61·4	62·2	63·8	61	...	57	62	60	62	57
22	62	62	62·7	62·3	62·6	59	...	60	63	60	61	62
23	64	67	65·3	67·7	68·1	65	64·2	64	60	63	60	59
24	62	62	62·3	64·2	65·4	61	58·9	62	64	62	62	64
25	63	61	59·8	62·1	63·9	61	62·1	57	66	63	60	65
26	62	65	60·8	65·3	65·2	61	58·9	...	62	59	58	61
27	62	60	57·9	59·7	60·8	58	...	...	59	53	57	59
28	63	60	60·3	60·9	60·7	58	...	...	61	59	58	58
Highest	64	67	65·3	67·7	68·1	65	64·2	64	66	63	64	65
60° or above	11	12	8	10	12	7	...	4	11	6	7	4

At Kensington the number of minima above 60° was 12, the same as at Brixton and Camden Square, and we believe that these numbers are altogether unprecedented.

Drought.

Drought was general over the South of England from Devonshire to Essex for about three weeks ending on 26th, but further North it was broken by TSS on or about the 12th, while in the N. of England and in Scotland there was no long dry period. The following records are sufficient to indicate the general area of the drought, which was not remarkable for its duration:—

	County.	Station.	Date of beginning and ending.	Duration.
I.	*Middlesex*	Finchley (Etchingham Park)	July 5th to 22nd	22 days
II.	*Surrey* ...	Wallington	,, 7th ,, 26th	20 ,,
,,	,, ...	Farnham (Seale)	,, 6th ,, 26th	21 ,,
,,	*Kent*	Birchington (Thor)	,, 4th ,, 26th	23 ,,
,,	*Hants* ...	Alton (Ashdell)	,, 4th ,, 19th	16 ,,
,,	*Berks* ...	Maidenhead (Cookham Vic.)	,, 3rd ,, 26th	24 ,,
III.	*Herts* ...	Broxbourne	,, 7th ,, 26th	20 ,,
,,	*Bucks* ...	Slough (Upton)	,, 7th ,, 26th	20 ,,
IV.	*Essex* ...	Southend (Water Works) ...	,, 7th ,, 26th	20 ,,
V.	*Devon* ...	Hartland Abbey	,, 14th ,, 30th	17 ,,

Comparison with 42 Preceding Years.

At Camden Square the max. temp. on July 16th, 1900, 95°·2, is the highest recorded on any day since observations commenced in 1858; while that of the 25th, 94°·0, has been exceeded only by 94°·6 on July 15th, 1881. On five days the temp. rose above 90°, while in only one previous July, that of 1868, had 90° been reached on as many as four days. On the 25th the temp. was above 90° from 11.30 a.m. to 5 p.m. On 17 days the max. was above 80°.

The records of 92° or upwards in the 42 years 1858–1899 are :—

1881.....July 15th.....	94°·6	1858.....June 3rd	92°·6
1893.....Aug. 18th.....	93·6	1876.....July 15th.....	92·6
1868.....July 21st.....	93·3	1872..... ,, 25th.....	92·3
,, ... ,, 22nd.....	93·2	1876.....Aug. 13th.....	92·3
1881..... ,, 5th	92·7	,, ... ,, 14th.....	92·1
1893.....Aug. 17th.....	92·7	1884..... ,, 11th.....	92·0

The min. temp. on the 23rd, 67°·7, is the highest for any day since the record began in 1858; and the min. on 26th, 65°·3, has been exceeded only four times. There is no other instance of two nights with min. temp. above 65° in one year. On ten nights the minimum did not fall below 60°.

The minima of 65° and upwards in the 42 years 1858–1899 are :—

1872.....July 26th.....	66°·3	1868.....July 23rd.....	65°·7
1899..... ,, 12th.....	66·0	1898.....Aug. 15th.....	65·1
1876.....Aug. 18th.....	65·8		

The mean temp. for July, 1900, 68°·6, is 5°·3 above the average, and has been exceeded only in 1859 (68°·9) and 1868 (68°·8). On five days the mean temp. was above 75°·0 :—

16th.....	76°·8	19th.....	75°·2	20th.....	77°·0
24th.....	76·9	25th.....	77·6		

Ten days after, on August 5th, the mean temp. was 56°·4, or 21°·2 lower.

These mean temperatures are not unprecedented, for during the preceding 42 years there were 20 days on which the mean temp. was above 75°, and we find the following records :—July 15th, 1881, 78°·9; July 22nd, 1868, 78°·7; July 21st, 1868, 78°·1; August 18th, 1893, 78°·1; all higher than any day in 1900.

Absolute drought prevailed for 20 days, 7th to 26th, and the total rainfall is little more than half the average. The duration of the drought is by no means remarkable.

During the thunderstorm on the afternoon of the 27th, the pressure first rose ·09 in., the highest point being at 3.40 p.m., and then fell ·18 in., the lowest point being about 5.15 p.m. The curve was quite normal in type, but the amplitude was at least twice as great as any I have seen before in England. At Edith Road, Kensington, the barograph shewed a rise of about ·1 inch and a fall of ·16 inch.

Observers' Notes.

Middlesex.—*Kensington, Edith Road.* Mean max. temp., 78°·3; mean min., 59°·1; both the highest in 17 years. On 15 days the max. was above 80°, on 4 above 90°: 16th, 92°·4 (highest on record); 19th, 92°·1; 20th, 90°·9; 25th, 91°·4. On 12 days the min. was above 60°—the highest being 68°·0 on 23rd, but this has been twice exceeded.—*Finchley, Etchingham Park.* Absolute drought for 22 days, broken by a heavy TS on 27th, when ·84 in. of R fell.

Surrey.—*Redhill, Oxford Road.* Mean temp., 65°·2; 3°·6 above the average. Mean max., 75°·2; mean min., 55°·0.—*Wallington.* The mean dry bulb, the absolute and mean shade max., and the mean temp. are all the highest recorded; and the duration of sunshine is 100 hours above the average, and the highest with one exception. Average max. 6°·6, and mean temp. 4°·9, above the average. TSS on 3rd and 27th.

Kent.—*Tenterden.* From 10th to 27th there was a period of intense heat, the max. being above 80° on 13 days, and on 16th being 91°·0, which is the only max. above 90° since July, 1876. On 20th the 9 a.m. temp. was 84°, and on 20th and 23rd the min. was 65°.—*Birchington, Thor.* One of the hottest months on record; the temp. in screen rising to 92° on 16th. Absolute drought for 23 days, ending 26th. T and L on 3rd, 27th and 29th. Duration of sunshine, 356 hours 35 min.

Sussex.—*Crowborough.* Very warm from 8th to 26th, with a max. temp. of 87°·5 on 19th; and minima of 64°·0 on 19th, and 64°·2 on 22nd. TSS on 16th and 27th.

Hants.—*Hartley Wintney.* Solar radiation max. on 16th, 138°; on 19th, 134°; on 26th, 135°. Shade max.: 16th, 88°·0; 19th, 92°·5; and 26th, 91°·0.

Herts.—*Hitchin.* The hottest day (91°·0 on 25th), the hottest night, and the hottest month in the records extending over 50 years.

Bucks.—*Slough, Upton.* Duration of bright sunshine, 290 hrs. 6 min., no sunless days. On more than half the days the max. temp. rose above 80°, the three highest being 90°·5 on 16th; 91°·5 on 19th; and 91°·0 on 25th.—*Winslow, Addington.* Max. temp., 92° on 25th; never exceeded, and equalled only on June 9th, 1858, August 13th,

1876, and August 18th, 1893. 80° was reached or exceeded on 13 days.

OXFORD.—*St. Giles.* On 15 days the temp. reached 80°, the max. being 89°·0 on 19th and 25th. Mean temp. 4°·9 above the average.

CAMBRIDGE.—*Elm, Grove House.* Solar max. in vacuo on 22nd, 149°.

DORSET.—*Winterbourne Steepleton.* The max. temp. 84°·2 on 19th, is the highest since June 18th, 1893, when 84°·9 was registered.

SOMERSET.—*Wellington.* On 19th the temp. rose to 87°·0, and on six other days reached or exceeded 80°.—*North Cadbury.* On only four days after the 10th was the max. temp. below 80°; while the minima on 20th and 21st were 67° and 62°.

GLOUCESTER.—*Cirencester, Further Barton.* Intense heat began on 15th, and continued without intermission until 27th, when a TS occurred, following great darkness at 3 p.m.—*Cheltenham.* Max. temp. on 19th, 90°·5; the highest for at least 23 years.

HEREFORD.—*Ross, The Graig.* The night of the 8th, with min. 39°·6, was as exceptionally cold as that of the 23rd was warm, with a min. of 64°·2. The average max., 76°·8, has been exceeded by 77°·4 in 1876, 78°·0 in 1870, 76°·9 in 1869, and 80°·5 in 1868.

SHROPSHIRE.—*Church Stretton.* Great heat from 10th to 27th, when 13 days drought was broken by a violent TS, with 1·32 in. of R. Temp. above 80° on 4 days; max. 82°·5 on 19th.

CHESHIRE.—*Wilmslow, Parksyde.* It is amazing what a difference of temp. the 1° 48′ of latitude between here and London makes; the max. temp. here was 85°·0 on 11th, but on 4 nights the min. was above 60°, the highest being 64°·2 on 20th.

LANCASHIRE.—*Bolton, The Park.* The mean temp., 60°·6, is 2°·9 above the average and a record for July; the max., 82°·3 on 11th, and the min. on 20th, 64°·7, are also the highest recorded.

MONMOUTH.—*Llanfrechfa Grange.* Max. temp. above 80° on 8 days.

DUMFRIES.—*Maxwelton House.* Hot from 10th to 28th, but no excessive heat. TSS on 11th and 21st.

EDINBURGH.—*Blacket Place.* Mean temp. 61°·0, being the warmest July since 1887. The mean min., 54°·2, is the highest since August, 1857, when it was 54°·5.

AYR.—*Colmonell.* Mean temp. 4°·3 above the average, and the highest in 25 years.

ARGYLL.—*Inverary, Newtown.* Very wet, there being seldom 24 hours of good weather.

PERTH.—*Coupar Angus.* The highest mean temp. in 20 years; no high maxima, but several very warm nights.

DUBLIN.—*Ballybrack, Streamville.* Mean max. temp. 73°·3; mean min. 51°·7; mean temp. 62°·5. On 23rd the min. was 62°. On 28th ·39 in. of R fell in 15 minutes.

JULY 3RD.

MIDDLESEX.—*New Southgate.* A severe H storm came up from the N. at 4.37 p.m., lasting about 10 minutes, accompanied by R, L

and T. The stones averaged about half-an-inch in diameter, and were pear-shaped; they covered the ground to a depth of about three-quarters of an inch. The damage to foliage was enormous, but no glass is known to have been broken.

JULY 12TH.

BRECON.—*Llandefaelogfach.* Severe TS, with H of unusual size. Some by actual measurement ¾ inch in diameter, and weighing nearly an ounce. Great breakage of glass and destruction of crops. R 1·71 in.

JULY 16TH.

HERTS.—*Berkhamstead, Rosebank.* R began shortly after 1.30 p.m., and when it ceased, 16 minutes later, 1·14 in. was measured. For four minutes the R came down at the rate of seven inches an hour. The ground was so dry that less than one-eighth of the fall percolated through two and a half feet of bare soil; while in the percolation gauge, covered with short grass, only a few drops penetrated.—*Kensworth.* TS 1.15 p.m. to 2 p.m. R 1·00 in.; great darkness, and lights necessary; before the R commenced there was a severe gale and dust storm.

SUFFOLK.—*Bury St. Edmunds, Westley.* TS and more damage by H than in the last 50 years. The heaviest H appeared to be limited to a track 300 yards wide, but at least 5 miles long.

YORK.—*East Layton Hall.* Heavy TS.

JULY 20TH.

OXFORD.—*Magdalen College.* Heavy TS between 1 and 2 p.m.

NORTHAMPTON.—*Northampton, Kettering Road.* Heavy TS, with H of unusual size; two of the stones, carefully weighed, were found to be just ¾-oz. each. One was spherical, the other a flattened oval. This place, about a mile from the centre of the town, was evidently about the edge of the storm.—*Sedgebrook.* TSS all day, with very heavy H, which did considerable damage. R 1·13 in.

SUFFOLK.—*Ipswich.* Unusually large H; much glass broken.

GLOUCESTER.—*Stroud, Upfield.* TS from 11 a.m. to noon; a house was struck at *Cainscross*, ¼ mile W., and a tree about 200 yards N.E. —*Cirencester, Further Barton.* TS; a tree struck near.

WARWICK.—*Bedworth Cemetery.* T and very large H stones or cubes of ice.

LINCOLN.—*Hemingby.* Two contiguous cottages were struck by L, and in one the bed was set on fire.

DERBY.—*Breadsall Priory.* Heavy TS, and 2·27 in. of R in 4 hours.

WATERFORD.—*Brook Lodge.* Heavy TS. A cottage struck by L, and some sheep and cows killed.

JULY 27TH.

SURREY.—*Redhill, Oxford Road.* L and T from 2.30 p.m. to 3.30 p.m. and from 6 p.m. to 9 p.m.; some H.

SUSSEX.—*Selmeston Vicarage.* I was much surprised by the long duration of the L. A flash at 3.14 p.m. seemed to descend in a continuous straight line, and lasted for several seconds. I never saw anything like it before. 1·07 in. of R fell.

HANTS.—*Alton, Colmer Rectory.* The L was very persistent in character; about 2 o'clock I saw three perpendicular flashes succeed each other, during which I had time to count three. One storm had passed from the west northwards; this was in a second storm, which passed to the S., it was near at one time, but there was little R.

BUCKS.—*Winslow, Addington.* Very heavy TS.

OXFORD.—*Magdalen College.* TS during whole of afternoon and evening.—*Oxford St. Giles.* T almost continually from 2 p.m. to 10 p.m., with L and R.—*Swerford.* TS overhead; ·63 in. of R fell in three quarters of an hour.

WILTS.—*Alderbury.* T. A soldier was killed by L in camp; and a mill at *Stratford-sub-Castle* was burnt.

GLOUCESTER.—*Stroud, Upfield.* TS at night, and another house struck ¼ mile W.

BRECON.—*Abergwesyn.* Heavy TS in distance, L very vivid for 2 hours. R ·72 in.

CARLOW.—*Castledermot.* Violent TS, and 1·30 in. of R.

JULY 28TH.

CORK.—*Wellesley Terrace.* TS in the morning.—Cattle killed at *Midleton* and *Cloyne.*

KERRY.—*Killarney.* TS and 2·05 in. of R.

CARLOW.—*Castledermot.* Violent TS, and 1·26 in. of R.

JULY 29TH.

SURREY.—*Redhill, Oxford Road.* L and T with H about 1 p.m.

WARWICK.—*Coventry, Priory Row.* Violent storm of H and R.

NOTES FROM THE NEWSPAPER PRESS.

JULY 3RD.

Middlesex.—New Southgate. For a quarter of an hour H fell heavily in stones, of which the average size was larger than that of ordinary marbles, many being as large as walnuts. The H covered the ground in sufficient quantities to induce boys to come round with brooms to offer to sweep it away.

South Lincolnshire.—H stones as large as acorns fell.

(*To be continued.*)

WARM AND COLD SUMMERS.

To the Editor of the Meteorological Magazine.

SIR,—Mr. Parbury's table (p. 58) seems instructive, so far, though it might have been well to state in what sense he understands "average," "hot," and "cold." No potency of numbers was suggested by me.

The following way of looking at our London summers may be

found useful. Consider all the summer months separately in each group of years, 1800–04, 1810–14, &c. (*i.e.*, 15 months in each case), and similarly in each group, 1805–09, 1815–19, &c.; calling each month hot or cold as it is above or below the monthly average. We may then construct a table as follows :—

	a. Hot Months	*b*. Cold Months	Hot Months.		*c*. Hot Months	*d*. Cold Months	Hot Months.	Relation of *c* to *a*.
1800–04	11	4	+7	1805–09	11	4	+7	equal
1810–14	3	12	—9	1815–19	5	10	—5	+2
1820–24	3	12	—9	1825–29	8	7	+1	+5
1830–34	5	10	—5	1835–39	6	9	—3	+1
1840–44	5	10	—5	1845–49	7	7	equal	+2
1850–54	5	10	—5	1855–59	12	3	+9	+7
1860–64	3	12	—9	1865–69	8	7	+1	+5
1870–74	8	6	+2	1875–79	10	5	+5	+2
1880–84	5	10	—5	1885–89	8	7	+1	+3
1890–94	5	10	—5	1895–99	12	3	+9	+7
			—43				+25	+34

Thus it appears that in nearly all the earlier groups (0–4) hot months were less numerous than cold ones, and in most of the later groups (5–9) hot months were in excess. Further, the hot months in the later group were in excess of those in the earlier in every decade except one, when they were equal. (The figures previous to 1841 are to be taken "*cum grano.*" In cases where the sum 15 is not made up, one month was average.)—Yours faithfully,

ALEX. B. MACDOWALL.

A RAINBOW.

To the Editor of the Meteorological Magazine.

SIR,—The rainbow seen by me here to day at 5.40 p.m. presented some features which may be worth recording. It was of great brilliancy, and the band was of unusual width. For a little more than half its length the arc was backed by dark grey cloud; the remainder, only slightly less brilliant, was projected across an absolutely cloudless sky of deep blue. Above the primary bow was the secondary, with the colours, of course, reversed; but the strangest feature of all was the repetition of the primary bow itself; the spectrum reappearing below it in immediately succeeding, though narrower and less brilliant, bands without any reversal; the repetition giving two additional bows across the cloud, and three additional across the clear sky; there being no spaces intervening between the lower portion of each spectrum and the upper part of the next.—Yours truly,

JAMES G. WOOD, F.R.Met.Soc.

115, Sutherland Avenue, July 29th, 1900.

CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, JANUARY, 1900.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Absolute. Maximum. Date.	Absolute. Minimum. Temp.	Absolute. Minimum. Date.	Average. Max.	Average. Min.	Average. Dew Point.	Average. Humidity.	Absolute. Max. in Sun.	Absolute. Min. on Grass.	Total Rain. Depth.	Total Rain. Days.	Aver. Cloud.
	°		°		°	°	°	0-100	°	°	inches		
London, Camden Square	53·9	24	25·8	14	45·7	34·8	37·0	87	75·2	19·7	2·92	21	7·0
Malta	67·7	2	41·2	14	60·2	50·7	48·0	78	114·4	39·8	5·51	15	4·7
Cape of Good Hope	94·9	18	54·8	31	77·6	60·4	57·3	69	...	...	·40	6	3·4
Mauritius	87·0	14	70·1	3	85·7	73·6	69·4	74	153·4	62·3	3·35	17	6·1
Calcutta	86·3	24	50·8	14	80·7	59·5	58·0	68	140·6	41·5	·00	0	3·1
Bombay	87·0	11	61·0	25	81·1	67·1	62·0	66	132·4	51·9	·00	0	1·2
Ceylon, Colombo	92·4	21	68·5	2, 3	89·8	72·6	71·5	80	155·6	65·5	3·72	9	2·5
Melbourne	106·9	28	47·0	9	81·7	58·7	52·9	58	160·2	40·5	3·30	10	5·3
Adelaide	112·2	1	51·8	9	87·3	63·3	50·0	43	167·0	43·3	·67	8	3·9
Sydney	92·4	27	59·8	15	80·0	65·2	61·9	68	148·3	49·0	1·67	12	4·5
Wellington	76·0	2	45·0	6	68·7	53·6	49·8	67	137·0	39·0	2·41	9	4·0
Auckland	77·0	22	50·0	5	72·5	58·4	54·9	69	138·0	46·0	·84	5	3·5
Jamaica, Halfway Tree	...	...	...	...	...	...	...	...	...	...	·52	4	...
Trinidad	89·0	sev. days	65·0	2	87·6	69·3	67·8	74	164·0	62·0	3·56	17	...
Grenada	...	...	...	...	...	...	...	...	...	...	...	...	...
Toronto	46·0	19	·00	3	33·5	18·6	23·5	82	60·5	—5·5	1·94	21	7·2
New Brunswick, Fredericton	47·8	20	—23·0	1	29·2	1·2	9·7	78	...	...	4·79	12	5·4
Manitoba, Winnipeg	41·8	19	—30·7	31	17·6	— 4·4	...	...	...	...	1·05	6	5·2
Victoria, British Columbia	52·7	7	31·0	29	47·0	39·6		...	...	...	3·60	21	7·3

REMARKS.

MALTA.—Adopted mean temp. 55°·3, or 2°·2 above average. Mean hourly velocity of wind 13·8 miles, or 2·6 above average. Mean temp. of sea 63°·0. TS8 on 3 days; L on 4 days; H on 5 days. Dew point ranged from 59°·6 on 1st to 36°·3 on 30th. J. F. DOBSON.

Mauritius.—Mean temp. of air 0°·4 above, of dew point 0°·5 and rainfall 3·56 in. below, their respective averages. Mean hourly velocity of wind 8·8 miles, or 2·3 below average; extremes, 22·9 on 12th and 1·7 on 2nd; prevailing direction, E.S.E. to E.N.E. L on 4 days. T on 2 days, and L and T on 26th to 28th, and 30th and 31st. T. F. CLAXTON.

CEYLON, COLOMBO.—Mean temp. of air 79°·7, or 0°·6 above, of dew point 1°·7 above, and rainfall ·63 in. above, their respective averages. Mean hourly velocity of wind 7·4 miles; prevailing direction N.E., N. and N.W. TS occurred on the 8th. L on 12th and 13th. H. O. BARNARD.

Adelaide.—Mean temp. of air 1°·1 above, and R ·16 in. below, their respective averages for 43 years. Temperature above 100° on 8 days, or 3 above the average. C. TODD, F.R.S.

Sydney.—Temp. 1°·0 above, humidity 3°·7 below, and rainfall 1·93 in. below, their respective averages. H. C. RUSSELL, F.R.S.

Wellington.—Small total rainfall, but some nice light showers. Prevailing winds N.W., and generally moderate. On the whole a pleasant month. Temp. 1°·5 below, and rainfall 1·50 inches below, their respective averages. R. B. GORE.

Auckland.—Fine and dry throughout the month, the only rain of consequence (·63 in.) being recorded on the 8th. Mean temp. nearly 2° below, rainfall less than one-third of, the average. T. F. CHEESEMAN.

TRINIDAD.—R ·62 in. above the 30 years average. J. H. HART.

SUPPLEMENTARY TABLE OF RAINFALL, JULY, 1900.

Div	STATION.	Total Rain.	Div.	STATION.	Total Rain.
		in.			in.
I.	Uxbridge, Harefield Pk..	·81	XI.	Builth, Abergwesyn Vic.	3·38
II.	Dorking, Abinger Hall .	1·13	,,	Rhayader, Nantgwillt ...	2·25
,,	Birchington, Thor	1·63	,,	Lake Vyrnwy	2·38
,,	Hailsham	1·43	,,	Corwen, Rhug	1·32
,,	Ryde, Thornbrough	1·19	,,	Criccieth, Talarvor	1·74
,,	Emsworth, Redlands ...	1·23	,,	I. of Anglesey, Lligwy..	1·33
,,	Alton, Ashdell	1·74	,,	I. of Man, Douglas	2·31
III.	Oxford, Magdalen Coll..	1·15	XII.	Stoneykirk, Ardwell Ho.	3·46
,,	Banbury, Bloxham	1·90	,,	New Galloway, Glenlee	...
,,	Northampton, Sedgebrook	2·28	,,	Moniaive, Maxwelton Ho.	2·47
,,	Alconbury	·74	,,	Lilliesleaf, Riddell	4·24
,,	Wisbech, Bank House...	1·39	XIII.	N. Esk Res. [Penicuick]	3·85
IV.	Southend	1·46	XIV.	Glasgow, Queen's Park..	3·03
,,	Colchester, Lexden	·73	XV.	Inverary, Newtown	5·36
,,	Saffron Waldon, Newport	1·17	,,	Ballachulish, Ardsheal...	5·49
,,	Rendlesham Hall	·90	,,	Islay	2·76
,,	Scole Rectory	...	XVI.	Dollar.....	4·01
,,	Swaffham	2·18	,,	Balquhidder, Stronvar...	3·26
V.	Salisbury, Alderbury ...	·59	,,	Coupar Angus Station...	2·37
,,	Bishop's Cannings	2·31	,,	Blair Atholl	2·69
,,	Blandford, Whatcombe .	·73	XVII.	Keith H.R.S.....	5·63
,,	Ashburton, Holne Vic...	·89	,,	Forres H.R.S.	2·79
,,	Okehampton, Oaklands.	1·24	XVIII.	Fearn, Lower Pitkerrie..	3·48
,,	Hartland Abbey	1·16	,,	S. Uist, Askernish	1·64
,,	Lynton, Glenthorne ...	1·55	,,	Invergarry.....	5·35
,,	Probus, Lamellyn	·92	,,	Aviemore, Alvie Manse.	3·01
,,	Wellington, The Avenue	1·43	,,	Loch Ness, Drumnadrochit	4·94
,,	North Cadbury Rectory	·90	XIX.	Invershin	3·38
VI.	Clifton, Pembroke Road	·88	,,	Durness.....	...
,,	Ross, The Graig	2·68	,,	Watten H.R.S.....	4·05
,,	Wem, Clive Vicarage ...	2·36	XX.	Dunmanway, Coolkelure	2·58
,,	Wolverhampton, Tettenhall	2·15	,,	Cork, Wellesley Terrace	1·56
,,	Cheadle, The Heath Ho.	3·07	,,	Killarney, Woodlawn ..	3·17
,,	Coventry, Priory Row ..	1·61	,,	Caher, Duneske	3·41
VII.	Market Overton	1·77	,,	Ballingarry, Hazelfort...	...
,,	Grantham, Stainby	1·40	,,	Limerick, Kilcornan ...	1·58
,,	Horncastle, Bucknall ...	·99	,,	Miltown Malbay	3·30
,,	Worksop, Hodsck Priory	1·75	XXI.	Gorey, Courtown House	2·83
VIII.	Neston, Hinderton	1·43	,,	Moynalty, Westland ...	2·08
,,	Southport, Hesketh Park	·79	,,	Athlone, Twyford	2·48
,,	Chatburn, Middlewood.	3·18	,,	Mullingar, Belvedere ...	1·92
,,	Duddon Val., Seathwaite Vic.	2·85	XXII.	Woodlawn	3·42
IX.	Melmerby, Baldersby ...	1·20	,,	Crossmolina, Enniscoe ..	2·68
,,	Scalby, Silverdale	1·23	,,	Collooney, Markree Obs.	1·54
,,	Ingleby Greenhow Vic..	1·63	XXIII.	Enniskillen, Model Sch.	...
,,	Middleton, Mickleton ...	1·46	,,	Warrenpoint.....	3·65
X.	Haltwhistle, Unthank H.	1·50	,,	Seaforde..	4·17
,,	Bamburgh	1·21	,,	Belfast, Springfield	4·50
,,	Keswick, The Bank	2·01	,,	Bushmills, Dundarave..	2·81
XI.	Llanfrechfa Grange	1·79	,,	Stewartstown	3·81
,,	Llandovery	3·24	,,	Killybegs	2·96
,,	Castle Malgwyn	1·44	,,	Horn Head	2·34
,,	Brecknock, The Barracks	...			

JULY, 1900.

Div.		STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL. Total Fall.	Difference from average 1880-9.	Greatest Fall in 24 hours. Dpth	Greatest Fall in 24 hours. Date	Days on which ·01 or more fell.	TEMPERATURE. Max. Deg.	Max. Date	Min. Deg.	Min. Date.	No. of Nights below 32°. In shade.	No. of Nights below 32°. On grass.
			inches.	inches.	in.								
I.	ENGLAND.	London (Camden Square) ...	1·50	— 1·18	·58	27	7	95·2	16	44·5	8	0	0
II.		Tenterden	1·52	— ·83	·57	27	7	91·0	16	43·0	8	0	0
,,		Hartley Wintney	·54	...	·26	27	8	92·5	19	47·0	19	0	0
III.		Hitchin	1·96	— ·76	1·03	16	10	91·0	25	43·0	7	0	...
,,		Winslow (Addington)	1·50	— 1·79	·63	31	7	92·0	25	45·0	8	0	0
IV.		Bury St. Edmunds (Westley)	2·04	— ·53	·64	20	10	83·0	20	43·0	8	0	...
,,		Norwich (Brundall)	1·72	...	·63	6	12	87·2	25	46·8	8	0	0
V.		Winterbourne Steepleton ...	·94	...	·28	13	9	84·2	19	39·1	8	0	0
,,		Torquay (Cary Green)	·64	...	·17	31	7	79·7	25	49·2	3, 8	0	0
,,		Polapit Tamar [Launceston]..	1·20	— 2·21	·47	31	14	83·8	19	41·0	10	0	0
VI.		Stroud (Upfield)	2·17	— 1·40	·86	31	11	84·0	24	48·0	7	0	...
,,		Church Stretton (Woolstaston)	2·38	— ·59	1·14	27	11	82·0	24	45·0	8	0	0
,,		Worcester (Diglis Lock)	1·96	— ·91	·74	27	8	...	...	...	...	...	...
VII.		Boston	·70	— 2·09	·25	16	6	90·0	19*b*	39·0	8	0	...
,,		Hesley Hall [Tickhill].....	1·95	— ·72	·36	12	11	89·0	11	40·0	8	0	0
,,		Breadsall Priory	4·27	...	2·27	20	13	...	...	...	...	...	...
VIII.		Manchester (Plymouth Grove)	2·47	— 1·32	·59	27	13	88·0	11	45·0	3, 7	0	0
IX.		Wetherby (Ribston Hall) ...	2·89	— ·29	1·13	21	13	...	...	...	...	...	...
,,		Skipton (Arncliffe)	2·44	— 3·20	·63	12	15	...	...	...	...	...	...
,,		Hull (Pearson Park).....	1·62	— ·97	·52	3	12	85·0	25	39·0	8	0	0
X.		Newcastle (Town Moor)	1·38	— 2·14	·52	2	10	...	...	...	...	...	...
,,		Borrowdale (Seathwaite).....	4·09	— 6·90	·80	31	19	81·3	20	41·4	8	0	...
XI.	WALES.	Cardiff (Ely).....	1·78	— 2·28	·63	31	11	...	...	...	...	...	...
,,		Haverfordwest	·98	— 3·23	·48	31	8	80·1	19	41·9	8	0	0
,,		Aberystwith (Gogerddan) ...	1·76	...	·89	31	11	84·0	19*c*	...	...	0	...
,,		Llandudno.....	1·00	— 2·00	·21	27	14	83·0	20	52·0	27	0	..
XII.		Cargen [Dumfries]	3·28	— ·65	·51	20	20	77·0	26	42·0	8	0	0
XIII.		Edinburgh (Blacket Place)...	2·92	...	·53	17	17	77·4	10	46·1	8	0	0
XIV.		Colmonell	2·95	...	·65	27	15	83·0	18	46·0	2, 7	0	...
XV.		Tighnabruaich	5·02	...	·87	31	22	70·0	18	43·0	6	0	...
,,		Mull (Quinish).....	4·73	+ ·68	·80	22	23	...	...	...	...	...	...
XVI.		Loch Leven Sluices	3·50	— ·12	·50	16	15	...	...	...	...	...	...
,,		Dundee (Eastern Necropolis)	3·30	— ·16	·55	15*a*	20	79·0	10	46·0	7	0	...
XVII.		Braemar	3·45	+ ·24	·59	2	22	73·8	10	39·2	31	0	0
,,		Aberdeen (Cranford)	4·26	...	·76	28	24	76·0	18	41·0	7	0	...
,,		Cawdor (Budgate)	3·45	+ ·15	·53	12	22	...	...	...	...	...	...
XVIII		Strathconan [Beauly]	2·77	— ·73	·58	3	15	...	...	...	...	...	...
,,		Glencarron Lodge.....	...	...	...	...	...	...	..	...	...	...	...
XIX.		Dunrobin	5·29	+ 2·44	1·22	14	17	73·0	11*d*	43·0	4	0	...
,,		S. Ronaldshay (Roeberry) ...	3·20	+ ·84	·57	12	26	70·0	11	43·0	3	0	...
XX.		Darrynane Abbey.....	1·59	...	·30	12	19	...	...	...	...	...	...
,,		Waterford (Brook Lodge) ...	3·54	+ ·01	1·25	26	13	73·0	22*e*	43·0	8	0	...
,,		Broadford (Hurdlestown) ...	...	...	...	...	...	...	...	...	...	...	...
XXI.	IRELAND.	Carlow (Browne's Hill)	4·17	+ ·65	2·10	27	15	...	...	...	...	...	...
,,		Dublin (Fitz William Square)	4·52	+ 1·84	1·87	27	15	78·0	24	47·1	8	0	0
XXII.		Ballinasloe	2·68	— ·87	·42	13	17	72·0	10*f*	50·0	2*h*	0	...
,,		Clifden (Kylemore)	...	...	...	...	...	...	...	...	...	...	...
XXIII		Waringstown	3·09	— ·43	1·20	25	16	85·0	*g*	38·0	7	0	...
,,		Londonderry (Creggan Res.).	4·17	+ ·05	1·09	28	21	...	...	...	...	...	...
,,		Omagh (Edenfel)	3·33	— ·39	1·22	27	20	73·0	21	43·0	6	0	...

+ Shows that the fall was above the average ; — that it was below it.

a—and 28. *b*—and 24, 25. *c*—and 20. *d*—and 18. *e*—and 23. *f*—and 19, 22, 24.
g—on 6 days. *h*—and 6, 27, 28, 29.

METEOROLOGICAL NOTES ON JULY, 1900.

(*See also pp.* 97 *to* 106.)

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Max. for Maximum; Min. for Minimum; T for Thunder; L for Lightning; TS for Thunderstorm; R for Rain; H for Hail; S for Snow.

ENGLAND.

TENTERDEN.—The month began wet, but from 10th to 27th was intensely hot. TSS on 3rd and 27th. Duration of sunshine 287 hours.

HARTLEY WINTNEY.—The driest and hottest July recorded here; half the total R falling in a TS on 27th. T on 3rd, 16th, 27th and 29th. Ozone on 10 days, with a mean of 2·7.

WINSLOW, ADDINGTON.—A dry, hot month. T on 4 days; very heavy on 27th, when there was much vivid L.

BURY ST. EDMUNDS, WESTLEY.—The month was very hot after the 10th, with very heavy TSS on 16th and 20th. TSS also on 3rd, 27th and 29th.

WINTERBOURNE STEEPLETON.—The early part was cool, but in the latter part the temp. was much above the average. The mean temp. is 61°·3, whilst for July, 1899, it was 61°·6, and for August 62°·9. These 3 months are the hottest since the record began in 1893. T and L on 27th.

TORQUAY, CARY GREEN.—R 1·81 in. below the average and mean temp. 2°·3 above the average. Duration of sunshine 86 hours above the average. No sunless day. Mean ozone 4·6, the highest being 8·0 on 7th and 30th with S.W. winds, and the lowest 0·5 on 23rd and 24th with N. and E. winds.

POLAPIT TAMAR [LAUNCESTON].—Very hot and dry. T and L on 11th and 12th.

MANCHESTER, PLYMOUTH GROVE.—The first week was unsettled and cool. From the 10th to 28th fine summer weather prevailed. T and L on 12th, 20th, 28th and 29th.

WALES.

HAVERFORDWEST.—Generally fine and hot, with small R and high temp. From the 12th to 16th an almost continuous gale blew. Distant TS on 20th. Unusually high min. temperatures were recorded, 59°·8 on grass on 25th and 62°·8 in shade on 20th. Duration of sunshine 171·6 hours.

ABERYSTWITH, GOGERDDAN.—Very hot, with much bright sunshine.

SCOTLAND.

EDINBURGH, BLACKET PLACE.—R and duration of sunshine slightly below the average. TS on 21st, and distant T on 3rd.

COLMONELL, CLACHANTON.—R ·51 in. below the average of 24 years.

TIGHNABRUAICH, CRAIGANDARAICH.—The Bar. was high during the month, being below 30 inches on only 8 days, nevertheless we had continuous R.

ABERDEEN, CRANFORD.—This month was wet, with little sunshine.

S. RONALDSHAY, ROEBERRY.—Wet and mild. Mean temp. 57°, or 2°·3 above the average.

IRELAND.

DARRYNANE ABBEY.—Except from 5th to 11th there was no real summer; the weather being close and misty, with drizzling R.

WATERFORD, BROOK LODGE.—Much T during the month. A cottage was struck by L near here, and some sheep and cows were killed.

DUBLIN, FITZWILLIAM SQUARE.—Very warm, but unsettled, and closing with a great rainstorm. Mean temp. 63°·4, or 2°·8 above the average. High winds on 6 days. The temp. reached, or exceeded, 70° in the screen on 14 days, whilst in July, 1887, it reached, or exceeded, 70° on 17 days. TSS on 2nd, 3rd, 20th and 28th. T on 29th; L on 27th. H on 3rd and 20th. Fog on 11th and 21st.

OMAGH, EDENFEL.—The R was almost exactly the average, and fell almost entirely in torrential showers, except a remarkable fall of 1·32 in. in 8 hours, ending 11 a.m. on 28th. There was no continuance of clear skies, nor any great heat, and even during the fine periods the weather was mostly dull and humid, and unfavourable for haymaking. A phenominal crop was, however, fairly saved.

HAIL IN JUNE, 1900.

To the Editor of the Meteorological Magazine.

SIR,—May I call the attention of your readers to the shape of some of the hailstones which fell during a thunderstorm experienced in Westminster near midday on the 25th June, since it appeared to me to be somewhat peculiar.

In form they closely resembled that of a boy's peg-top, the length along the major axis of two which I measured being slightly over half-an-inch, whilst their diameter at the widest part was exactly 0·4 inch in both instances. But perhaps the most noticeable point was that whilst below the widest part of the stone the ice was quite opaque, the rounded cap of ice above was perfectly clear and transparent, the dividing line being sharply defined right through the diameter of the hailstone. The stones were apparently unusually brittle, and many of them flew into fragments as they struck the window-sill where I observed them. I should add that all the hail which fell was not of this character, the bulk of it being much smaller and of no well-defined shape.

R. H. CURTIS.

[We are indebted to the Rev. F. C. Clutterbuck, of Culham Vicarage, near Abingdon, for photographs of hailstones which fell near there on June 12th. The photographs indicate the familiar type of hailstone, oval in form with corrugated surface and composed of layers of opaque and clear ice. The photograph gives the actual size of the stones, and careful measurement shews diameters of 2·25 in., 2·24 in. and 2·23 in. for the three largest.—ED. *M.M.*]